VOL. XIX] [No. 8.

THE

INDIAN FORESTER;

A MONTHLY MAGAZINE

OF

FORESTRY,

AGRICULTURE, SHIKAR & TRAVEL

EDITED BY

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AUGUST 1893.

MUSSOORIE:

PRINTED BY THE MAFASILITE PRINTING WORKS COMPANY, "LIMITED."

1893.

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Kamela Dye.

X

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THE

INDIAN FORESTER.

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A tour in Jaunsar.

BODYAR FOREST. April 21st to 26th.

This forest, which has an area of 1,463 acres, has been protected from fire since 1872. Owing to its proximity to the villages below Chakrata, heavy demands were made on it before it came into the hands of the Forest Department, and in 1869, when Chakrata was built, a good deal of timber was taken out. The consequence is that the large deodar trees are far apart and are quite unfit for sleepers, being covered with branches; but there is a young forest of poles coming on which will in course of time be exceedingly valuable.

The first sowings in Bodyar were made in 1872, seed being sown in drills close to the bungalow, and superfluous plants put out into blanks. The present average height of these plants is 18 feet (88 trees measured).

In 1875, nurseries were formed in various sheltered places. We visited one of these situated below the bungalow to the west of the path leading down the spur. Several deodar plants were left in this nursery and they now form a complete canopy; the lower branches have died and were pruned off in 1892 by the students, and the height of the dominant trees is now over 30 feet.

Measurements taken at different times in this old nursery are as follows:—

April,	1886,	Average height		8 ft. 2 in.
May,	1887,	„ „		11 ft. 5 in.
April,	1888,	„ „	(24 plants)	13 ft. 0 in.
„	1892,	„ „	(27 plants)	21 ft. 0 in.
„	1893,	„ „	(13 plants)	30 ft. 7 in.

This excellent growth is due to the good soil and sheltered position, and to the roots remaining undisturbed.

The plantation formed by plants from this nursery is No. 7 of 1878, situated in compt. 4, to the east of the path. The aspect is south-east, as a rule, and the soil is rocky and shallow. The plants are yellow, and the progress made has been slow. In May, 1887, the height was 3 ft. 8 in ; in April, 1888, the average of 25 plants was 4 ft. 2 in. ; in 1893, the height of 333 plants was 6 ft. 9 in ; the average length of last year's shoot was 6 ins., but it varied from 3 ins. to 15 ins. according to soil, aspect, &c. Blue pine was sown in patches between the deodar some 6 or 7 years ago, and is now growing strongly with more than one plant in each patch; there are however many gaps.

From this plantation we descended to the Bodyar fields, and went up to Bangialani dhar, through compartment 1, and a series of old patch sowings of 1877 and 1878. Generally speaking, blue pine and deodar were sown in patches, and in several of them there are 4 to 5 plants, but there are many blanks, and the crop is nowhere continuous. In favourable aspects, the height of the taller deodar is 15 to 18 ft. and that of the blue pine some four to five feet higher. The following account of these sowings was given in the Journal of 1888 :—

" We inspected various sowings of 1877 and 1878 along the 'path to Bangia Lani ; deodar and blue pine were sown in 'patches, every fourth patch being sown with the latter ; the 'average height of 84 deodar was 4 feet 4½ inches ; the average 'height of 31 blue pine was 6 feet 4 inches ; these were situated 'below the path, and it is believed they were sown in 1877.

'The slopes above the path were sown in December, 1878, and 'here the average height of 88 deodars was 4 feet 7 inches, and 'the average of 29 blue pine, 5 feet 11 inches.

'The aspect where these sowings have succeeded best is north-'west, and the soil deep and good ; on this aspect young deodars 'did not present that yellow appearance which we noticed in the 'plantation of 1878 on the southerly aspect."

The heavy snow of the past winter which drifted over the ridge and was still lying in deep masses at the time of our visit, has done an immense amount of damage to the young plants, smashing them completely in several instances, up-rooting and bending down others. In cases where the plant is broken in two, it would be advisable to lop of the broken part just above a verticel, and trust to one of the side branches forming a leader. Plants that are merely bent down might be supported from underneath by a forked stick.

In 1892, we found the average height of 82 deodar to be 10 ft., of 23 spruce fir (also sown there) 6 ft. 8 in, ; and that of 30 blue pine 12 ft. In the lower portion below the path, the deodar shewed a height of 10 ft. 8 in. ; and blue pine 16 ft.

We examined the matted state of the grass in this portion of Bodyar, and the difficulty of natural reproduction by seed under such circumstances was clearly explained. Natural reproduction

of pine and deodar rarely takes place under such conditions, but only when the grass is quite short and the rootlets of the germinating seed can reach the soil ; the best examples of all are recently abandoned fields as at Koti Kanasar. But the preservation of the grass for 20 years has resulted in a fair amount of vegetable mould, and in all patch sowing, or pit planting here, the black soil clinging to the roots of the grass should be well beaten out and mixed with the soil in each case.

The cones of deodar, blue pine, and spruce fir were shown to the students and the different manner in which the seed is dispersed was explained. The two former trees are the best for resowing blank slopes.

On the way back, we passed through the thicket of deodar mentioned in the Journal of 1888, as follows :—

" On the road to camp, we examined a large patch of natural ' deodar which has sprung up in some old fields abandoned about ' 19 or 20 years ago ; the aspect of this slope is north, and the crop ' of deodar is so dense that it is difficult to make one's way through ' it. This is an absolute proof, if any were needed, that deodar will ' prosper in good soil and on a favourable aspect without any pro- ' tection overhead."

Since then several of the fir have been girdled and the lower branches of the deodar pruned. Some of the fir girdled two years ago are still alive, generally the larger ones. For facility of moving about inside this thicket the suppressed trees might be removed, and the lower branches pruned off ; this would facilitate the inspection and study of this interesting young crop ; but it must be remembered that over large areas of an almost pure crop such as this is, the removal of suppressed trees is not advisable, first of all on account of the expense—the produce not being saleable—secondly, they are of great assistance in helping to form clean boles.

On the way back to camp we passed some deodar poles marked for sale to the Sappers and Miners. This is an instance of a true thinning, and the object of such an operation and the manner of carrying it out were explained to the students. The leaf canopy would not be interrupted by this thinning, and yet the dominant trees would have more space given to their crowns to increase laterally. A better example than this could scarcely be found.

April 21st. We inspected plantation No. 1 of 1881. It is situated in Ganwa, Compartment 7 (c) of Working Plan, and was raised from seed sown in December, 1878. Some of the plants in the Bodyar nursery were pricked out into beds with a hard bottom, others were raised in ordinary beds in Ganwa. For some years a difference was noticeable between the growth of these two series of plants, and in 1891, it was found that the average height of the plants raised on hard bottoms was about 10 inches more than the ordinary plants. We did not however observe an appreciable difference between the plants and did not take separate measurements.

In 1891, the average height of 320 plants was 4 ft. 2 in.; and in 1893 we found the average height of 152 plants to be 4 ft. 11 in.

The aspect of this plantation is E. N. E. and the slope 35°. The plants out in the open are looking yellow. We measured the the height of 11 plants growing under the shelter of a large blue pine, and found the average to be 6 ft. 9 in., thus shewing the beneficial influence of side shelter. These plants were hoed in August, 1892, and the grass quite cleared round their roots, and it remains to be seen what effect, if any, this operation will have on their growth. This loosening of the soil, immediately before such an exceptionally severe winter has undoubtedly allowed the snow to bend down the plants more than it otherwise would have done; but this of course could not have been foreseen and in ordinary years the operation would have been most useful.

On the *25th April*, we examined plantation No. 8 of 1878. It is situated above the Ganwa path and on the western side of the first large ridge going from the Bungalow (Compartment 4 of Working Plan). 1,131 deodar plants were measured and gave an average height of 9 feet. One plant had an annual shoot of 29 inches. On the whole the progress made has been slow, and the plants are yellow.

Plantation No. 3 of 1879 is situated just below this, between the upper and and lower Ganwa paths :—918 deodar growing on the westerly aspect had an average height of 9 ft. 6 in.; while 62 plants growing on a southern aspect shewed an average height of 6 ft. 6 in. The minimum was 3 ft. and the maximum 30 ft. Lower down blue pine has been sown in patches, and is now 6 or 7 years old with an average height of 4 ft. 6 in. (440 measured).

Near the landslip, 93 deodars gave an average height of 14 ft. 10 in.

Both these plantations were raised from seed of 1875, sown in the Bodyar nurseries; in the upper plantation, the plants were 2 years old when put out in July, and in the lower one, 3 years old.

Strip sowing of Blue pine in Ganwa.

In Compartment 7 (*a*), over an area of 28½ acres, strips running in contour lines were hoed up last year, and all grass roots removed. The strips are 2 ft. and 4 ft. wide alternately and the uncultivated belts between are about 3 ft. wide. The aspect is easterly as a rule and the soil very poor. Blue pine seed was dibbled in, in June, and again sown broadcast and trodden in with the foot in July. Countings on a portion of these strips were conducted as follows;—a rod 4 ft. long was laid along the strip and the number of seedlings counted in this length; if a seedling was found in the length of 4 ft. it was counted as a success.

The results were as follows :—5,113 four-foot lengths were counted : of these 3,663 were blank, and 1480 had seedlings in

them, to the aggregate number of 2,390. Hence the percentage of success is 28·8, and of failure 71·2. The soil is of a bad quality and the situation is dry, hot, and exposed, and it is to be feared that some of the existing seedlings will die. In December, grass was placed over the young plants as a protection but several have since died notwithstanding this precaution.

Blue pine has numerous enemies to contend with, when sown in the open. Birds eat the seed, grubs cut through the roots, and later on a beetle attacks the leaves.

It is intended to plant deodar along these strips at intervals of 10 or 12 feet, the idea being that the pine will grow up faster and act as a nurse ; a commencement has already been made in this respect, and about 1,700 plants have been put out. In the lower portion of this area, cuttings of willow and poplar have been used to mark the planting spots and nearly all of them have struck root and are sending out young leaves. If these cuttings should survive, it might be advisable to make an experiment on a larger scale, as if willow and poplar could be got to grow, it is possible that the problem of a nurse for the deodar might be solved. Any how the experiment would not cost much, and it is well worth trying.

The experience of 18 years in Bodyar has clearly proved that on the drier and hotter slopes, it is essential to raise some crop as a nurse first of all, and blue pine would appear to be the best for this purpose. Indigofera and other woody shrubs answer very well, but as a rule they only grow in good soil, sheltered ravines, &c. There are, scattered about Bodyar, some blue pine trees, self sown, dating from the commencement of fire-conservancy in 1872. There are not many of them, and no parent trees are visible in the area ; but the seed has been brought by the wind possibly from the heights of Moila, or by the agency of birds; plants have sprung up, and there are now several trees, 21 years old, with an average height of 24 feet, and girth of 21 inches (16 trees measured). They have already begun to shed seed, and from observations made, it is believed this seed is fertile, and a second crop is now being gradually produced on the ground. Had there been many more of them it would have been possible to underplant deodar before this, with every chance of success. The instance mentioned above of a solitary pine sheltering 11 deodar plants and giving them two feet in height above those in the open sufficiently proves this.

We also examined some sowing (July 1892) of blue pine in roughly made patches on two slopes in Ganwa. On a southerly aspect, 3,010 patches contained 1,371 blanks, and 169 patches with seedlings in them to the number of 3,973 ; percentage of success is 54·5, and of failure 45·5. The average number of seedlings is 2·4 per successful patch.

On a westerly aspect, but on a much steeper slope, 847 patches contained 397 blanks and 450 successful patches with 946 seedlings in them, giving a percentage of success 53, and of failure

The average number of seedlings is 2·1 per successful patch.

Besides general inspection of the forest and measurements of the various plantations as given above, the following works were done by the students :—

307 basketted plants were put out in prepared pits in Ganwa, Sub-Compartment 7. (*a*) and (*d*).

513 patches were sown with deodar seed and several contour lines were laid out for strip sowing. Last autumn the ground had been cleared and lightly hoed up under two deodar seed bearers near the Forest Chauki, and the number of seedlings that had come up were counted. Under the first tree, belts 10 ft. wide were counted separately ; the first just above the tree contained 3 seedlings ; the second one with the tree in it, contained 18 ; then in descending order 21, 6, 5, 3, 0, 0, 0.

Under the second tree, belts six feet wide were examined ; the one immediately above the tree had 285 seedlings ; the one containing the tree had 920 ; and the three next belts below, 701, 318, and 45 respectively. This small experiment shews that deodar seed is not carried far by the wind ; generally we noticed seedlings underneath the parent tree and not out in the open at any distance.

As mentioned above, snow has done an immense amount of damage this year, a portion of a well stocked slope in the lower part of Ganwa, about one acre in area, has been shaved clean off, leaving the underlying rock quite bare. The uprooted saplings might be transplanted into large pits. All over Bodyar, plants have been bent down, through an angle which varies from 10 degrees to 80 degrees. It will be interesting to note in future years if they regain an erect position.

A small insect, probably a *Chermes*, produces a gall at the ends of the branches of spruce fir ; the bud becomes arrested in growth, thick and fleshy with scale-like leaves ; inside, around the edges, may be observed numerous minute pink grubs, which eventually develop ino flies and leave the small cone-like bud through a series of apertures. This year, we noticed very few of such galls, but in ordinary years they are quite common.

A fungus, *Œcidium Thomsoni*, also attacks the ends of the side branches in the spruce fir producing pretty yellow tassels, which turn deep orange, then red, and then black, when they dry and fall off. Neither the insect or the fungus appear to do much harm, and they do not attack, as a rule, the leading shoots.

Excursion to Moila. On the way we noticed an abandoned deodar nursery in a damp ravine shut in by trees. Such places are exposed to frost, and the elevation being 8,000 feet which is too high for a deodar nursery, the site was wisely abandoned.

The boundary pillars of Bodyar forest are made of dry rubble masonry 4 ft. cube on a plinth $5' \times 5' \times 1'$. The wooden post bearing the number is fastened to a cross piece embedded in the masonry to prevent its being pulled out. These pillars are unnecessarily large, costing Rs. 3-8-0 each.

From the top of Moila peak which is 9,058 ft. above the sea, there is a grand panorama of the country round on all sides. To the south we have the compact Bodyar forest enclosed in an amphitheatre and looking from here particularly well stocked as we could not see the bare southern aspects ; the fire line on which we were standing could be traced nearly the whole way round. To the west, we have the Chor Mountain nearly 12,000 ft. high and covered with forest except on the very summit, then more to the north, the high peaks of Chachpur and Kuphar, over 10,000 ft. and covered with *Karshu* Oak and the white birch to the top. The Pabar and Tons valleys were visible for miles, and in the distance the leased forests of Lambatach and Deota could be made out, the horizon for more than 100 miles on the north being bounded by the snowy range, conspicuous in which rose the peaks of Bunderpunch, commonly known as Jumnotri.

The grassy top of Moila itself is a high level grazing ground for the sheep and goats of the neighbouring villages, and their camping places in small hollows are common everywhere, with the piles of stones on which they keep fire burning all night to scare off leopards. On the north side of Moila we went down through the second class forest of Missau. It is open to grazing, and closed to fire, and the reproduction is on the whole very good. Here and there, the sheep and goats nibble the young conifers, and reduce them to the state of stunted bushes, described in the Journal of 1888, as follows :—

" We then passed through some forest near Kophti open to graz-
' ing, and on the bare grassy slopes we found that the conifers are
' regularly browsed by sheep and goats. The appearance presented
' by the deodar, blue pine, and spruce fir when thus treated is re-
' markable ; they resemble short squat bushes, much broader than
' high, with innumerable little branches and twigs ; those we saw
' were about one foot high with a thick carrot-like root and, judging
' from the annual rings, 10 to 12 years' old. We were not able to
' determine satisfactorily at what time of the year this damage is
' done, but believe it to take place during the late autumn or early
' winter, when the grass is killed by the early frost ; the conifers
' are probably also browsed when snow is on the ground."

It is stated by the local Forest guards that this browsing takes place in the summer when the sheep and goats first come up, and the young needles are fresh and juicy.

But this grazing is not very extensive except in the immediate neighbourhood of the camping grounds, and wherever there is a sufficient number of seedlings on the ground the young plants gradually grow up and form thickets, notably in the case of the blue pine. The great difference in the reproduction between the Bodyar forest with its hot dry slopes and thick matted grass, and that in the Missau Forest is most striking and the principal reasons for this will be given hereafter.

(*To be continued.*)

"Protected Forests."

In the April number of the *Indian Forester* an article headed "A plea for Protected Forests" has appeared; and though the article is both interesting and in the main justly supports the point contended for, it has I think somewhat missed the real objection to *the provisions as they stand* in Act. VII of 1878, regarding Protected Forests, and also is calculated to give rise to some misapprehension of what the law really is. It was no part of my intention in the *Manual* (and this will I hope be still clearer in my shortly forthcoming "Lectures on Forest Law") to object to making legal provision for the protection of lands which, under the circumstances, it is not worth while to treat under Chapter II. If lands are liable to be washed away (and such lands seem to be mostly in the contemplation of the writer in the April Number) it is not likely that there will be any extensive *rights of user* in them and that alone would justify their being placed under a system less complete than Chapter I describes But even so, the procedure under Chapter II would be very easy when there are no rights, for it is then very much a matter of form.

It has always been contempleted (vide the Burma Act, XIX of 1881) that there should be legal provision for the protection of forest and waste lands which (for any cause) it is not desirable to demarcate and settle expensively. The cases in which such provisions can be carefully applied are chiefly: (1) where the conditions are undeveloped, and it is not certain whether the area is really wanted as permanent forest, or whether it had not better be (ultimately) given up to cultivation; (2) where there are no rights of any kind, so that there is really no need of any action but clear demarcation, and an announcement of the public right and public control of the area, so that new comers and others in future may not imagine that the area is "no man's land" and available for them to do what they like with; (3) where there are such complications that some kind of protection, however imperfect, is better then none. And I may now add such a case as that now put forward—riverain forests where the alluvial area is liable to constant change.

But the objection to Chapter IV. is its *general* principle; that it appears to allow the forests permanently required by all social, economical and climatic conditions and possibly burdened with rights, to be *called* "Protected Forests'—although none of the essential elements of a really definite security of the area as *State property* (for the public benefit,) are provided.

Chapter II alone represents the conditions under which a forest permanently wanted for the good of the country can be fully and legally established. The whole question depends on the existence of rights (or long standing practices which are equitably

regarded as rights). All waste land belongs in theory to the State, this being one of the most ancient land rights known in India. But time, neglect, and many other circumstances have brought about a state of things in which the rights of the State have been mixed up (so to speak,) with what have become (or are allowed to be) the prescriptive rights of villages or private persons.

These are vague and indefinite in most cases. If there are no rights, no questions to be adjusted, then of course there is no serious difficulty about the procedure, even that under Chapter II becomes short and easy. But when the forest is very much needed by the people, and therefore numerous demands for grazing, wood-cutting and other rights have grown up there, it is evident that we want a permanence of the forest area, and its cultivation in such a way as to secure continued productiveness—its always going on fulfilling its useful functions ; and *that* in the long run will *not* be done if rights are not settled, if vague claims are not defined, and if it is uncertain what rights Government has and what rights other people have, and are still acquiring, by lapse of time. Chapter IV, it is evident (on an analysis of it) does *not* effect this : I cannot weary you by going into the whole case, but permit me to remind you that, in ninety-nine cases out of a hundred, what is wanted is not the knowledge (a record) that some person or persons has a general unlimited right of 'grazing' (—anything and everything at any time) or of 'woodcutting', but a power to decide : to say as a Settlement Officer, 'I admit as a fair representation of what this man, or this 'farm really needs, and what his (or its) equitably acknowledged 'right ought to be, that he can graze so many cows and oxen, so many 'sheep, (or whatever it is) in certain months, and under certain 'conditions, which are needed for the safety of the estate.' Without that however, a mere enquiry and record of rights such as Sec. 28 vaguely prescribes is of no use to the forest, and very little to the rightholders. Admittedly then, an officer could be appointed to make such an enquiry (which may be conceded by a process of inference, but no power exists to enable the officer to define or *decide* anything, nor is there any appeal against a decision if one could be given. The powers cannot be conferred by Rules* for it is an obvious principle that Rules may fill in details, but cannot be used to extend the scope of an Act, and convey distinct powers, which the Act itself does not give, and indeed rather pointedly omits. The whole difficulty was, that the Committee who revised the draft Act did not understand the subject, and they insisted on putting in Sec. 28, *not* to protect the forest, but to protect the right-holders against the wicked and grasping Forest Officer ! They perceived that they must leave it vague, for if they provided the

* I must here point out that Section 71 is no help, no power of decision is given.

necessary apparatus of letting there be a regular officer, with power to decide and to define, and with an appeal against his order, what would become of the difference between Chapter II and Chapter IV (as altered by them)? The framers of the Act as it originally stood, always intended that, when for some reason a complete and permanent settlement was not desirable or possible, protection should be given by certain provisions, but that *no attempt* should be made to do the work of settlement, *i.e.* to define and record rights. It was always intended, that if anyone were prosecuted (which practically would rarely happen,) and he set up as a plea—'I did this because I had a right'—the plea should (if fairly probable or established,) be an entirely sufficient answer. The whole objection to Chapter IV, then, is *not* that such a chapter properly drafted is not useful in certain cases, but that an important and inconclusive procedure should not (merely to save trouble and expense,) be applied to forests in which *rights* ought to be settled once for all: and there is an obvious temptation to save trouble by declaring forests 'Protected' which, if they are in the midst of a large population and much utilized by right-holders, will—as certainly as anything can in this world be predicted—slowly but surely deteriorate and finally disappear altogether. There ought to be only *one* class of forest regularly and sufficiently established to secure its *area* from being frittered away, and its *management*, being such as will enable the productiveness—*for whatever is wanted*, whether large timber for D. P. W. or small stuff, or grazing for the villages—to be sustained.

In a "protected" forest, new rights may always be growing up unless extraordinary care is taken, and if it is once admitted that one person or another has some kind of grazing, wood-cutting or other right, it is impossible for any one to fix 'how much' or 'how many' or any other feature of the rights which is at present uncertain.

I do not know where the writer gets the idea that in a regular forest, work cannot be done till settlement is over, while it can in the other case. Certainly the Act contains no such provisions. The forest being proposed to be "reserved" is necessarily, to some extent, the property of Government; and neither wood-cutting, nor private grazing (as it exists,) *need* stop for the settlement. All that is legally required is that fresh attacks on the soil (clearings,) should not be made *so as to introduce* fresh complications of ownership: also that new rights should not go on growing up or that rights as yet unestablished should complete a term of years by prescription. But Government is not obliged to suspend its work if any is going on, any more than a person having a plot of land in the forest would be obliged to cease cutting his crop or weeding the field; nor would existing grazing be stopped. The whole question I may repeat, is one of the existence of rights: these, if not settled, have an awkward way of growing and spreading till in the end the attempt to contest the forest is given up. There cannot be two ways of

securing an area as a *public estate for all time.* For if one of the ways legally effects the object, the other must be superfluous. There can only be one class of legally secure forests ; there may be other areas which though confessedly not secure, are placed under a certain degree of protection. It is a matter of local convenience and of a consideration of all the probabilities of the future to determine whether a secure forest-property should be constituted. The danger is to suppose, that with forest really wanted, whether by the local population, or by the State for valuable timber, you can shirk the really needed elements of legal and final security under Chapter II, by resorting to a (supposed) *other form* of permanent forest, which is really not satisfactory. Can any one point to a single 'Protected Forest' in India which *is* burdened with rights and which ought to be secure for all time, that has had the rights defined so that they cannot grow, and that is so ordered that new rights cannot arise in it ? The record made under section 28 can have no other effect than that of informing Government that a number of rights either really exist or are claimed, so the Government may, if it thinks rights are numerous, *decline* to allow the forest to be gazetted. That is really the sole object and intention of the alteration. It will be remembered that in 1878 at any rate, the one (inveterate) idea prevailing in official circles was, that if a forest was much overrun by the grazing and other requirements of neighbouring villages, the one and only thing to do, was to *give it up*, without control, to the villages, and abstain from including it in the list of Government forests altogether. It is supposed that somehow it would go on (at least for immeasurably long time), supplying what the villages wanted, without any care or cultivation. At best, it was vaguely dreamed, that in time, the villagers might be induced to do something of their own accord to adopt measures of reproduction.

The securing of area and the settlement of rights is, if anything, *more* wanted in forests very much in demand for satisfying village requirements, than it is in forests which are valuable to the State as " nurseries for gigantic teak trees."

I trust that these remarks will not be taken as ill-natured or as carping at a useful and clearly stated paper of criticism. On the contrary, the appearance of such a paper ought to be hailed with the greatest satisfaction. Nothing will be more conducive to the establishment of sound ideas of Forest law in practice, than the ventilation of the whole subject and the examination of specific cases in the lights of legal principles and provisions of the Acts, such as have been, I think almost for the first time, done in the paper on which I have been remarking.

B. H. B. P.

Oxford. May, 1893.

The Revenue of the Prussian State Forests.

The annexed diagram with the following remarks taken from the Forst und Jagd Zeitung may be of interest to foresters.

The area of the State Forests of Prussia is about 2½ million hectares or, say, 6,175,000 acres. The expenditure amounts to about 50 per cent. of the gross revenue : the net surplus during the last 20 years has varied between 22 and 28 million marks, but in the last two years has reached 35 million marks.

During the past 25 years, the gross revenue has risen from 44 to 73 million marks and 10 millions of this increase has taken place in the last 2 or 3 years.

The increase in area during this period has been about 4 per cent. but about the same area has been removed from Statr forest in the extinction of rights and whilst the area given was stocked with good forest, that acquired is either unstocked oe contains only young growth.

The average sale price of the outturn has not increased ; the outturn however has increased from 7 to nearly 10 millions cubic metres.

The conclusions arrived at are that, the selling price being constant, the yield and the gross revenue have increased by 1/3rd, whilst the expenditure and the net revenue still retain the same proportion *viz.*, 50 per cent. of the gross income. The net revenue per hectare, *viz.*, from 9 to 13 marks, is twice, in some cases thrice, more in other states of the German empire, but experienced foresters have doubts whether this high revenue is not exacted at the cost of the future and at any rate a high surplus is dependent on so many circumstances that it is by itself no criterion of the skill and knowledge of the Forest Officer. The increase in gross revenue in the last few years is entirely due to more extensive fellings but it is not shown whether this increase in outturn is justified by an increase increment and therefore whether or not the future revenue of the forests is injuriously affected. It is easy to increase the gross revenue from a forest by more extensive or intensive fellings, but the aim of the Forest Officer should be not to fell more trees but to grow more and better timber.

S. E—W.

Forests Versus Insects.

It is not only in the cases which attract general notice, as in that of the sal trees in Assam which are said to have been completely defoliated throughout two hundred miles of Forest in 1878, or in that of the teak plantations in Lower Burma which have recently been attacked by an insect reported as doing as much or more damage than an ordinary forest fire, that injury is occasioned

to forests by insects in India. For damage is constantly going on almost unnoticed upon a scale which interferes to a serious extent with the operations of the Forest Department. For proof one need go no further from the Forest School than the nearest highway, where nine-tenths of the young *toon* trees that line the road are stunted and their value as timber greatly reduced by the *toon* borer, which destroys the leading shoots almost as fast as they are put forth. Again, a walk down the Dehra Canal road brings one to spendid clumps of bamboos whose value must be lowered in a very great degree by the tiny borer which so frequently reduces dry bamboos to powder. But it is useless to multiply instances, for throughout the whole period of the growth of almost every forest tree in India, from the seed which is likely as not to be destroyed by weevil, to the timber which is liable to be eventually eaten by white ants, there is hardly a moment when it is not to some extent subject to attack from one kind of insect or another.

Something can no doubt occasionally be done, when the damage is noticed, but in the great majority of cases, curative measures are too costly for every day adoption in the forest. The question therefore of the general measures which are practicable for reducing liability to attack is of very great importance. The subject is one upon which the entomologist by himself is unable to express an authoritative opinion, for the matter largely depends upon practical considerations which the executive forest officer is alone in a position to weigh.

The majority of destructive forest insects are said to be continuously present in greater or smaller numbers in the forest. Under ordinary circumstances they are kept down by natural enemies and disease, but they are always liable to increase. A hundred eggs is by no means a large number to be laid by a single insect, and as, in the majority of cases, several generations can be gone through in one year, multiplication is excessively rapid, whenever abundance of food and absence of natural enemies and disease happen to occur in conjunction with weather that is favourable to the development of the species.

The presence of dead and dying wood in a forest undoubtedly tends to promote the multiplication of boring insects of all kinds. This is particularly the case with bark borers which often do a great deal of damage. Again, fallen leaves and litter, when left upon the ground, serve to shelter the pupæ of such insects as the destructive Teak *Hyblæa* from the birds which would otherwise destroy them. Before systematic protection was organized, forest fires probably served to some extent to clear the ground of litter, though the service thus rendered was much more than compensated for, even so far as insects were concerned, by injury to the vitality of the trees, resulting in the multiplication of boring insects. In forests that are protected from fire, and where the litter is not removed artificially, white ants are believed to be about the most important agents for converting dead wood into valuable soil.

Against this must be balanced the damage these insects occasionally do to freshly planted trees, and their ravages in dry timber and other substances not intended for the entertainment of Termites. If white ants could be extirpated elsewhere it would no doubt be most injurious to encourage them in the forest, but this not being the case it may very possibly prove that the protection of their nests is in many cases beneficial upon the whole, as tending very materially to reduce the amount of dead wood and litter of all kinds. The actual removal of dead wood and litter from the forest is no doubt most desirable wherever it is practicable, but the question of when this is the case must depend very largely upon local conditions. In any case, the removal of the leaves, though desirable from an entomological point of view, is not likely to be approved by the forester who considers them useful in other ways to the trees. When it is impossible to remove dead wood altogether, stripping off the bark and burning it is the next best thing, as wood is much less liable to harbour injurious insects when deprived of its bark. Prolonged immersion of timber in water is also said to be useful for the same purpose and is already largely utilized in the case of bamboos, though it is difficult to say to what extent it is to be recommended unconditionally for other timber.

Another feature of general importance is the fact that almost every destructive insect prefers some particular species of tree for its food, though it may also attack other trees to a smaller extent. A forest therefore which consist of a mixed assortment of different kinds of trees offers less opportunity for wide-spread injury than one which consists chiefly of single species. For the trees which are not liable to attack from the particular insect which happens to be in the ascendant, not only escape themselves but also tend to confine damage to the spot where it originally started. This fact has been largely taken advantage of within the last few years in the case of the destructive *nun* caterpillars in the forests of Central Europe where belts were formed round infested areas by clearing away the spruce undergrowth which was found to be chiefly liable to attack.

Again, the importance of protecting insectivorous animals of all kinds, and especially insectivorous birds, is very generally appreciated. The number of destructive insects destroyed by birds in India is believed to be stupendous, (1) and it is most desirable to afford every possible protection to the species that are of use. Care however should be taken to discriminate between such habitually insectivorous birds as the ground thrush (*Pitta*), which may be looked upon as purely beneficial, and such species as the rosy pastor starling (*Pastor roseus*) which is said to do more harm in devouring seed than good in eating up insects.

(1) Major Bingham writes with regard to the destructive Teak Hyblæa in Burma, that a plantation attacked by this insect is a wonderful scene of activity, as numbers of Jungle fowl, ground thrushes (Pitta) and insectivorous birds of all kinds crowd to the spot to feed upon the caterpillars.

We have seen that the multiplication of destructive pests depends to an enormous extent upon the presence or absence of parasitic and predaceous insects and of disease. These are elements of the very greatest importance and deserve careful consideration, though comparatively little has been ascertained upon the subject in India. Extensive experiments, in some cases attended with promising results, are being conducted in different parts of the world in connection with the possibility of controlling them artificially. The matter may not improbably become of immense practical importance hereafter, and in any case should prove most interesting for forest officers to study, though it has not yet advanced to the stage of immediate utility.

CALCUTTA, *19th May 1893.* E. C. COTES.

Obituary, E. J. N. James.

We regret to hear of the death at Chittagong of Mr. E. J. N. James, Extra-Assistant Conservator of Forests, Bengal. Mr. James was an Eurasian. He joined the Department as a probationary Sub-Assistant Conservator, in December, 1886. After following the course of instruction at Dehra Dun, he obtained the Ranger's Certificate in July, 1889, passing "with honours" in Mathematics and Forest Law, and was appointed a Sub-Assistant Conservator, 3rd grade. At the time of this death Mr. James was an Extra-Assistant Conservator of the 3rd grade.

Mr. James was of a quiet and retiring disposition, steady and hard-working, and always ready to undertake cheerfully whatever work was entrusted to him. He was generally known as one of the best Officers of the Provincial Forest Service.

II.—CORRESPONDANCE.

A 'Bureau de Recherches.'

SIR,

Every one is agreed that much energy is wasted in India by officers laboriously working out questions which perhaps have been already definitely settled elsewhere, and although to some extent this can be avoided by reading "The Indian Forester" and all the Annual Reports of the different Provinces, yet the diffusion of knowledge in this way is only partial because it

depends on personal whim whether or not the results are published in "The Forester," while to wade through Annual Reports is not enticing; could not, therefore, some better system to devised? I would suggest that some especially qualified officer should be appointed to collect and note on all such matters, with the liberty to travel to any part of India and see the different experiments in action. This officer should, I think, be subordinate the Director of the Forest School and should with him form a "Bureau de recherche," while the results of their enquiries might be regularly published in the *Indian Forester*, and so enable everyone to know exactly where to turn for information of this sort. Further, I should make the *Indian Forester* a state concern and relieve the Honorary Editor of much of the worry which he now has to undergo, and that he undergoes purely from public spirit To compare big things with small, it is enough to remember what immense strides medicine has made through the medium of publicly endowed institutions to see how a "Bureau de recherche" must be a step in the right direction.

I am aware this is not a new idea, but without a litttle drumming such things do not as a rule arrive at the stage of accomplished facts. I trust, Mr. Editor, you will lend your influence to forward this cause.

T.

A Departmental Blazer.

SIR,

I do not think that any of the colours given in the May Number are quite what we want for the Departmental colours. I would suggest olive green and dark crimson for the blazer, the green might be 2 inches wide, and the crimson ¼ or ½ inch, and for ribbons &c., in proportion. Why should we confine ourselves to greens only as if no other colours were ever to be seen in a forest.

I am sure the Coopers Hill members will on further reflection agree to join the movement for Departmental colours. I have constantly seen an Eton and Cambridge man, a fellow of his College and now a distinguished member of the Indian Civil Service wearing the Punjab Commission colours, why then should a member of the Forest Department, albeit a Coopers Hill man, be ashamed to wear Forest Colours.

We do not want any horns, or trees, or anything 'bigarre' or childish, but a combination of simple colours which will be neat and distinctive.

As to the ranks which shall be entitled to wear the colours: as the 'blazer' is eminently an English garment its use should be restricted to Englishmen, but there can be no objection to any member of the executive staff wearing the Forest Colours in ribbons,

or even in turbans, or in coats of the shapes ordinarily worn by natives; in fact, the turban selected for the subordinate staff in the Punjab is almost exactly of the colours here suggested being "green with red edging." I do not think it can be improved on for neatness of appearance or for durability of colour.

C. F. E.

Eucalyptus and Malaria.

SIR,

In the 'Forester' for June 1893, it is stated in an extract from a paper by Mr. Franklin B. Hough, that the formation of a plantation of Eucalyptus round the monastery of Tre-Fontane near Rome has resulted in the monastery becoming habitable, such had been also my idea until a week ago when Monseigneur Philabert Termoz, representative of *les missions étrangères* of France at the Vatican, who is now travelling in the East visiting these missions, told me that all of a sudden three years ago, after malarial fevers had all but disappeared from the monastery, the place had become almost as deadly as before and continues to remain so.

It will be extremely interesting to find out why the beneficial effects of the plantation have so suddenly ceased after having promised so well. Is it because the *massif* has become too dense to allow of an uninterrupted evaporation direct from the soil in addition to the transpiration from the trees? We foresters are aware that in wet lands the leaf-canopy should not be allowed to close up if we wish the ground to be dry enough for the production of seedlings.

BARODA,
1st July, 1893.

E. E. FERNANDEZ.

Freezing Temperature of Forest Trees.

DEAR SIR,

I read the following in Boppe's Sylviculture—"Quelques 'espèces, comme l'olivier et l'oranger, meurent gelées sous 'l'influence d'un froid prolongé à la température de -1°; d'autres, 'comme le pin sylvestre et le bouleau, supportent, sans paraître 'en souffrir, un froid de -40°."

Can any one tell me at what temperature Sal and Teak are frozen :—(i) in hollows; and (ii) in other places?

T.

III.-OFFICIAL PAPERS & INTELLIGENCE.

Durability of Railway Sleepers.

The annual statement published by the Public Works Department shewing the progress of the experiments to test the durability of railway sleepers takes us to the end of 1891.

On the Ajmere-Khandwa section of the Rajputana-Malwa Railway, sleepers of deodar, creosoted pine, kahoo (*Terminalia Arjuna*), sal, anjan, and teak were laid down in 1876. The following are the the results, at the end of 15 years:—

of the Deodar	...	...	94	per cent still sound
„ Sal ...	...	...	65	„ „
„ Kahoo	...	...	56	„ „
„ Anjan	...	...	51	„ „
„ Teak	...	...	40	„ „
„ Creosoted pine	...	...	33	„ „

In another section of the same railway creosoted pine shewed 41 per cent sound at the end of 11 years.

On the Rewari-Ferozepur section, 1,166 Deodar were laid down in 1882; and in 9 years, 288, or nearly 25 per cent had been removed; but a very much larger proportion of creosoted pine had to be taken out at the end of 4 years.

On the North Western Railway, in the experiment of 1877, only 100 Deodar sleepers have had to be removed out of 1,116 laid down originally, shewing that 91 per cent have lasted 14 years. In the other experiments on this railway, the results are not quite so good.

Sal is the principal timber experimented with on the Eastern Bengal Railway, with varying results: on the main line 62 per cent were still sound at the end of 14 years, while on the Rungpore branch, after 12 years, 78 per cent of the sleepers were still good. Experiments on this railway with regard to iron-wood are also being made, but it is too early yet to say anything about the result.

The conclusion is the same as that arrived at last year, viz. that of the timber under trial, Deodar has hitherto proved the best.

A. S.

The Grasses of the Sandur Hills.

We have received from the Madras Government the Report of the Government Botanist Mr. M. A. Lawson on some of the grasses of the Sandur Hills in Bellary which were sent to him for identification. The following remarks of Mr. Lawson on the condition of the specimens sent, shew that there is reason to hope that the practical teaching in the drying and preservation of plants now taught at the Forest School will not be wasted.

" The specimens were not properly prepared and had to be ' macerated in water, separated, and re-dried, before they could be

'named. The condition in which they are returned is the one in 'which they should have been sent."

Number.	Vernacular names.	Botanical names.	Where they grow.	Whether they are reproduced from roots or by seed.
1	Bothai hullu	Anthistiria	Grow in tussocks profusely at the bottom of hills ..	Reproduced both by seeds and roots. Used for thatching huts.
2	Jundigi do. .. .	Do. No. 1	Scattered growth ; grows best on the slopes	Reproduced by seed. Cattle like it when it is young.
3	Iskasi	Do. „ 2	Grow best at higher elevations and also profusely ..	Reproduced both by the seeds and the roots.
4	Nagamuruku grass ..	Anthistiria	They grow least in the ravines and shady places	Reproduced by seed. Good fodder grass.
5	Kadayadu hullu ..	Panicum fimbriatum ..	Growth scattered and not profuse ; will be found both at the top and the bottom.	Do. do.
6	Chippigi do. ..	Panicum Petiverii ..	Scattered growth everywhere, but not profuse	Do. do.
7	Aula do. ..	Panicum miliaceum ..	Growth scattered ; does not grow profusely anywhere ..	Do. do.
8	Korrala do. ..	Setaria glauca	Scattered growth, but not profusely. In some cases both on the top and at the bottom.	Do. do.
9	Sajji do. ..	Manisuris granularis ..	Grow best at higher elevations and also profusely ..	Reproduced by roots.
10	Kulthapri	Arthraxon lanceolatus ..	Grow best in a little rocky place and at higher elevations.	I o. both by seeds and roots.
11	Kempu kasari ..	Heteropogon contortus ..	Grows profusely everywhere, especially at higher elevations.	Do. by seed. Good fodder grass.
12	Semkini hullu ..	Do.	Grow profusely on the tops of hills and rocky places ..	Do. both by seeds and roots.
13	Bilaykasari	Do.	Grow best at higher elevations, but it will also be found below.	Do. do.
14	Sennakasari	Do.	Do. do. do. ..	Do. do. good fodder.
15	Sadav hullu	Do.	Grow best at higher elevations and also profusely ..	Do. do.
16	Chiti bothai	Andropogon Schœnanthus var. genuina.	Grow best at higher elevations, but it will also be found below	Do. by seed.
17	Maravali hullu ..	Andropogon pertusus var. insculpta.	Growth scattered both at the bottom and at higher elevations.	Do. both by the seed and roots. Best fodder grass.
18	Bagati do.	Chysopogon gryllus ..	Grow best at higher elevations and also profusely ..	Reproduced by seed. Good fodder grass. Cattle like it when it is young.
19	Naribalu do.	Aristida cœrulescens ..	Growth scattered ; will not grow anywhere profusely ..	Reproduced by seed.
20	Kadu ragi	Eleusine segyptiaca ..	Grow best on the slopes	Do.
21	Gubbu grass	Eragrostis megastachya ..	Grow best at higher elevations and also profusely ..	Do. Cattle like it when it is young.
22	Godi hullu	Do. bifaria ..	Scattered growth both on the slopes and the top, but not profuse.	

The habit of these grasses is erect. They flower in the latter part of September and in October.

Amended descriptions of Reserved forest boundaries

The following Circular has recently issued on this subject. "Cases arise in which it may be desirable to publish, by means of a 'fresh notification, amended descriptions of the boundaries of forest-'reserves already notified under section 19 of the Indian Forest Act, 'or under other forest enactments. It has been ascertained that 'there is no legal objection to this course, if the fresh notification 'merely provides for the substitution of a more exact and definite 'description of the boundaries for that which was originally notified, 'and which, though purporting to describe the boundaries as they 'existed at the time, has subsequently become incorrect or proved to 'be open to misconstruction.

'The procedure permitted in the foregoing paragraph must not 'be held to extend to any such alteration of the boundaries on the 'ground as would involve either the inclusion of new areas or the 'exclusion of any lands which have been declared by the previous 'notification to be reserved forest. Such changes require either a 'new settlement of the additions it is proposed to make, or, in the 'case of disforestation, the previous sanction of the Government of 'India."

Ethnology in India.

We have received from the Government of India papers relating to the Ethnological enquiries now being carried out all over India with Mr. H. H. Risley, of the Bengal Civil Service, as general Editor and referee. The enquiries will, of course, bring out and record an immense amount of valuable information, and, though we see that the Forest Department is not mentioned in the orders, we feel sure that there are many Forest Officers who might be consulted with great advantage, for there are probably few of its servants in India from whom Government could obtain information regarding jungle tribes and their manners and customs so easily as from those who manage its forests.

Analysis of the bark of Cassia Auriculata.

We have received official papers regarding some analysis of this bark so well known under the name of 'Avaram' or 'Tangodu throughout Southern India, which were made by Mr. D. Hooper, the Nilgiri Quinologist, for the Mysore Forest Department. Apparently, at first, the specimens sent were of young twigs only and so the Inspector-General of Forests and Plantations of Mysore complained to the Government of Madras and on enquiry the fact

was reported. As Mr. Lawson very properly pointed out, "the chemist is entirely dependant upon those who send articles for analysis for their sampling." Mr. Hooper's report runas as follows :—

" The Inspector-General of Forests quotes an analysis of tangedu 'bark made by me four years ago and notices a discrepancy between 'the results and those obtained on the analysis of a sample of the 'bark made in England by Professor Hummel. The sample 'was supplied me by Mr. Cameron and it consisted of young thin 'bark in small quills and contained much chlorophyll. It yielded 'the following on analysis :—

'Tannin	11·92
'Insoluble tannin (phlobaphene)	2·30
'Watery extract	22·35
'Ash	4·15
'Moisture	7·26

'On receiving this letter from the Inspector-General of Forests, 'I at once wrote for a sample of tangedu bark as used in the tan-'neries in Mysore district, and Mr. Cameron very kindly supplied 'me with a 3 lb. sample.

'This bark was evidently from an older shrub as it was thicker 'and in larger quills, and the tincture of the bark, made with rec-'tified spirit, was brown and not green as in the former case. It 'yielded on analysis the following constituents :—

'Tannin	20·12
'Insoluble tannin (phlobaphene)	4·90
'Watery extract	29·00
'Ash	6·40
'Moisture	7·80

'The amount of tannin was the mean of two separate determi-'nations, and this result was controlled by another estimation made 'by a different process. After exhausting the bark by means of 'spirit and water, a rich coloring matter was dissolved out of the 'bark with alkaline solutions. The tannin gave a blue-black colour 'with iron salts and therefore resembled gallotannic acid.

'It will be seen from the above analyses that the discrepancy 'referred to in the letter from Mysore was due to the fact that I 'was supplied with some young bark of *Cassia auriculata* in the first 'instance, and results were made to compare with the analysis of 'maturer specimens of other astringent drugs. That there is a great 'difference in the amount of tannin in the bark taken from different 'parts of the tree will be demonstrated from the results obtained 'recently in analysing some *Acacia decurrens*. The twig bark con-'tained 14·7 per cent. of tannin, the small or upper stem bark 25·4 'per cent. and the thick or lower stem bark 33·4 per cent.

'I am glad to have had this opportunity of examining the well 'known tangedu bark again, and trust the analysis will be interesting 'and satisfactory to the Inspector-General of Forests, Mysore, and 'to all who are concerned in the economic products of this country."

IV.—REVIEWS

Annual Forest Administration Reports for 1891-92 for Madras.

The year 1891-92 sees a new departure in the Madras Presidency in that instead of printing the Conservators' Reports and then reviewing them, the Board of Revenue has prepared the Reports themselves from the various District Reports and the remarks of the Conservators on them. The consequence, one that any experienced Forest Officer might have foreseen, is unsatisfactory, for the Report is less interesting than usual, though we are glad to see that the Board themselves are fully aware of its defects and have ordered that in future Conservators are to return to the system of submitting Circle Reports with the District ones and we presume that they intend to extract from these and compile an amalgamated one of their own. It is clear that the logical deduction would be that the Board are hard pressed to find work for their Secretaries. After all what use can all this amount of reviewing and counter reviewing be; this prolonged series of *post-mortem* enquiries into matters of a year which has long passed into ancient history. We are of opinion that the cumbersome system of longwinded annual reports with reviews of many pages is a drag on the work of Forest officers in all Provinces, but in the Madras Presidency it seems to be worse than anywhere, for not only the Conservators, but the Board of Revenue, the Local Government and the Government of India have all to have their say. A certain amount of record is doubtless necessary, but for all the officers of a Department to be forced, after a year's work has come to an end, to sit down and spend days which might better be devoted to their current duties, in compiling reports and statistics which very few will ever consult, and in writing long paragraphs on matters of little interest to anybody outside, seems to us a waste of time and money. And the more so is this the case as it is not only the professional officers themselves who have to do it, but those of the various secretariats have to analyse and write more until the whole subject is worn threadbare and another year's results have come to require attention instead. We hope that some day there will be a change and that a General Indian Forest Administration Report will issue like the very useful ones on the Railways and the Post Office. The Conservators would send up briefer but more professional reports to the Inspector General and he could submit one General Report to the Government of India. On the subject

of the Forest Reports and the position of the Madras Conservators we are glad to quote the following remarks from a leading article in the 'Madras Mail' which shew that the treatment accorded to the Department in Madras, has, as in the very similar but even worse case of Bombay, attracted the attention of unofficial observers.

"In a purely professional matter such as this the Board has 'naturally found itself in considerable difficulty, and has felt 'obliged to ask the Conservators to prepare in future a brief 'Report on the working of their Circles and the general progress 'of operations therein. It is wonderful that the Board should ever 'have dreamt that it was capable of dealing with so technical a 'matter adequately, although it is well-known to have no mean idea 'of its own omniscience. Still, we cannot but regret that it should 'endeavour to draw a parallel between the relative positions of the 'Forest Conservators, and of the Deputy Commissioner of Salt 'and Abkari; and we cannot believe that the Supreme Govern-'ment will allow such a subordination to continue much longer. The 'Report of this Department in future should, so far as its technical 'details at least are concerned, be prepared by professional hands. 'It is of little use reorganising the Department if the superior 'officers are to be reduced to the position of mere forwarding 'agents between Collectors and the Board, and if they are not to 'be treated as really responsible for the working of the Department."

It can hardly be expected that officers who are placed in the position thus described will do their best, and the result is likely to be that Government will continue to spend some six thousand rupees a month on three Conservators, who having no responsibility and no stimulus to exertion will wander about the country and do perfunctory work. If it is worth while for Government to employ Conservators (and it obviously *is* worth while) it is worth while to give them some position and some responsibility and to listen to their advice and allow them scope for their energy in professional matters.

We are very far from complaining of the Madras system by which the District Forest Officers are Assistants to the Collectors and our views have already been expressed in these pages, and were recently corroborated by one of the Forest Officers concerned, in the Article in our May number signed 'Coupe de regénération.' And a practical corroboration is afforded by the article 'The rights of Khonds' which we reprint on another page. But while we hold this part of the Madras system to be the best in India, compelling as it does the Revenue authorities to look at both sides of all Forest questions, we strongly doubt the value of the interference of the Board of Revenue and of their recent reduction of the Conservators to mere inspecting officers. We would draw attention to the article in the 'Madras Weekly Mail' of February 9th, 1893, entitled 'Figure Heads not Heads,' from which we extract the following :—

"A good deal has been lately said about the autonomy of the 'Forest Departments in India. Here in Madras the question has 'taken a peculiar form of its own, whereby the Conservators, *i. e.*, 'the Heads of the Department, have become the mere figure-heads 'of it, and nothing more. It would be curious to know by what 'process of ratiocination it was that such a clear-headed official as 'Mr. Bliss arrived at the scheme of organisation which has now been 'working for a short time past. He is not given to evolving 'camels out of his inner consciousness, and his "creation" of the 'Salt and Abkari Department is a living proof that he understands 'what the "chain of responsibility" means. The extraordinary 'thing in connection with this Madras Forest reorganisation is that 'the Government of India has no delusions as to its weak points, 'and is desirous of putting the Conservators on an entirely different 'footing by forming them into an Advisory Board, with a common 'head-quarters and with a Forest Secretary subordinate to them. 'The Inspector-General of Forests is understood to be on his way 'to Madras now, with the object of representing the Government 'of India's opinions more fully; but he has been told in so many 'words that it is little use his coming and that he had much better 'occupy his valuable time otherwise. Briefly, the Conservators' 'case is this. The Forest Code defines the position of the Conser-'vator as "a consulting and inspecting officer having authority in 'matters of finance and establishment." His position is analagous 'to that of Superintending Engineer in the Public Works Depart-'ment, who, under the Code of that Department, controls all the 'details of business arising in the Circle with which he is concerned, 'subject to the supervision of the Chief Engineer, and who affords 'Executive Enginers the benefit of his advice in the performance 'of their duties. But the position of the Conservator of Forests, 'as above defined, has been gradually usurped by Collectors on the 'one hand and by the Board of Revenue on the other, so much so 'that the Government quite recently ruled that a Conservator 'must be content to occupy the position of inspecting and advising 'officer, with limited authority in matters of establishment and 'power of control in matters of finance.

'If the expenditure incurred by the employment of three 'Conservators in this Presidency, amounting to more than 'Rs. 60,000 per annum (inclusive of establishment), is justifiable, 'it can only be so by allowing these officers to exercise the powers 'conferred on their *confrères* in the provinces under the Govern-'ment of India, in which the Forest Department is held to be a 'scientific department to be administered by officers specially 'trained for the purpose. Otherwise, if the Forest Department 'here can be administered by Collectors with the aid of District 'Forest Officers and by the Board of Revenue, the post of Conser-'vator might be abolished and the Department might be amalga-'mated with the Land Revenue Department. At all events, such 'measures would be in the direction of economy. It is clearly

'needless expenditure to maintain these well-paid officers for 'merely perambulating Districts and finding fault with works 'undertaken under the orders of Collectors."

We hope that it will not be long before Madras has a Governor once more who is strong enough to put down officialism, carry out the recommendations of the Government of India and put Conservators of Forests once more into their proper position instead of being mere registrars of so much correspondence. If there is one Department in India which ought to be allowed to escape from the trammels of office routine and the tyranny of the Babu it is the 'Forests'.

We are glad to see that the notification of the Reserved Forests is making good progress, for 2,063 square miles were done during the year, bringing the area on April 1st 1892, up to 7175 sq. miles. Selections for further reservations are being made in most Districts and we are glad to see that the extension of the Forest Act to the Ganjam Agency tracts is contemplated. We fear, however, it is the old story of 'shutting the stable door'—had the Government of 10 years ago listened to the advice of that old experienced Collector Mr. J. G. Horsfall, C. I. E., they might have been in time to rescue some of the big timber forests in a good condition.

An interesting part of the Report is the paragraph where the Board record the policy of the Government as regards grazing and the basis of their settlement of the question. They say :—

"In Government reserves, the cattle actually required for 'agricultural and domestic purposes have been held to have the 'first claim and surplus animals are to be allowed grazing only 'when the circumstances permit of it. The number of cattle re-'quired for agricultural purposes is assumed to be three head of 'cattle per holding, the "holding" being taken as the average 'acreage cultivated by a pair of tilling cattle according to the 'ascertained practice in each taluk. These agricultural cattle are 'to be charged half the rates of fees charged for other cattle; 'and for the latter class the following scale of fees has been laid 'down as a maximum :—

	per annum. RS.	A.	P.
'Buffaloes	0	8	0
'Bulls, cows, bullocks, calves, horses, asses and foals	0	4	0
'Sheep and goats	0	2	0

'Goats, however, are to be excluded altogether or confined 'to special restricted areas. In unreserved lands, grazing and the 'cutting of grass are to be free and unrestricted—*vide* rule 9 of 'the rules under section 26 of the Act. These principles received 'the entire approval of the Government of India, and Collectors

'have been requested to give effect to them, reporting in due course 'how they propose to distinguish agricultural from non-agricultu- 'ral cattle."

These orders might, we think, be followed with advantage in other Provinces, but there is one point which seems not to be discerned and that is, what villages are to be entitled to the cheaper rates for their agricultural cattle—in Madras, we presume, all villages will be so treated, for the forests are fairly well distributed over the country; but in other Provinces where the forests are mostly in large blocks away from the great cultivated plain, it would be rather difficult to fix the limit.

The remarks on *Natural* and *Artificial Reproduction* are usually interesting in the Madras Reports, but this year they are less so than usual, as it is natural to expect, for professional matters like these are much best treated by professional writers. However, we extract the following on the seeding of the thorny bamboo, with the remark that we should much like to hear some more on the subject.

"*Cuddapah.*—Except in two places in the Balapalli working 'circle, the *Bambusa arundinacea* seeded all over the district. It 'has not been ascertained, or reported, whether, in these two 'localities, the fellings and thinnings of the bamboo had anything 'to do with its non-seeding. In one place, the bamboos were cut 'up into three foot lengths and planted on the sides of a path to 'serve as a fence; when the shoots were four feet high, they 'seeded as did also the parent culms. The District Forest Officer 'concludes that this instance shows how all the bamboos of one 'clump, however separated, seed at one and the same time."

The financial results of the year were very good, though the surplus revenue was less than that of 1890-91. The figures were :—

Revenue	...	...	Rs. 16,94,215
Expenditure	...	...	„ 12,83,929
		Surplus ...	„ 4,10,286

The following is the yield of the forests for the year :

	cft.
Timber	... 3,086,937
Fuel	... 13,987,173
Bamboos	... 31,148,005
Value of Minor Produce	Rs. 6,40,842

V.—SHIKAR AND TRAVEL.

Chakla Drogmula.

(*Continued from page* 279.)

I must now hark back to Drogmula where demarcation was started; the village is situated in a veritable plain dotted here and there with large walnuts, a chinar or two and hundreds of fruit trees, some in regular orchards and others scattered about singly. The chinar does not thrive in this part of the country, the soil being probably too hard, as the tree appears to favour a sandy soil with a good supply of water. At Drogmula village there is one very curious old tree, the original trunk is a blackened and hollow shell, but the base close to the ground has spread out to a great size, perhaps 40 feet in circumference, and from this have sprung up some 50 other stems, these in turn as they have reached the size of of an ordinary tree, dying at the top and becoming blackened, the whole looking like a small grove of chinars. Here also is to be found the crooked and knotty *bér* (Zizyphus oxyphylla), very handsome sticks can sometimes be obtained from this. Demarcation was begun in the forest adjoining this village and at first there was great consternation among the villagers who imagined that all sorts of terrible things were going to happen from the putting up of the pillars. An idea got about that no land which had been even once ploughed, would be included, consequently there was a rush to hack down a few bushes and drive a plough then and there and then claim it as cultivated land. Some of the attempts were particularly barefaced, the ploughs having been run along only the day before. Sometimes the people were very obstinate, declaring they could not exist if the pillars were erected and winding up with the usual threat, dear to the Kashmiri, of going away to the Punjab, though what they would do there is is difficult to say: they would soon find the heat there somewhat different to that of their own country, for Jack Kashmiri does not like the heat any more than we do. However, they were quieted after a time and went on with the work, but it gets monotonous to have to meet and overcome the same silly objections in every new place. As a matter of fact we are very liberal, excluding not only all really cultivated land but also any that is cultivable, even at the expense of small patches of forest. We seldom have to clear lines through jungle, which delays the work very much, but can generally find an open line along the edge of the actual

forest ; the plan is to so place the pillars or posts that standing at one, the next in either direction can be readily seen ; the posts are about 7 feet long of which one foot is sunk in the ground, then a stone pillar is built up round the post to 3 feet above ground leaving 3 feet of the post visible, this is quite a sufficient land-mark and inexpensive. Here and there at prominent angles pukka pillars will be built, this will be done hereafter, the important thing is to get the boundary marked out in order to prevent any more land being broken up for cultivation. I was rather amused at one fine old Goojur who began the usual whine about *baubál hojate* &c ; I said "you are a *pardesi* surely you came from the Poonch State," he admitted the soft impeachment. I then told him he had no right to anything, the land being the property of the Kashmiris, but he said it was his *Kismat* to come long ago, so I retorted that I quite agreed and it was also my *Kismat* to come and put up the pillars : this struck him and he grinned cheerfully admitting it was so, and we became friends once more ! But the most curious idea of all, is one that these people have to the effect that I have leased the Kashmir forest for two years and they believe or pretend to, that I want to shut them out of the forests. It seems curious that, although I have been two years in the State, they should not know the real facts. It would appear that there was some proposal to lease the forests to a speculator just before I arrived on the scene, or more likely an offer was made by some sharp customer of a large sum down, if he got a lease. Luckily it was not entertained, or there would not have been much forest left ; the villagers probably heard of this and put two and two together making it five! The present position of affairs is a curious one, and this Department is somewhat in the position of a Bank on which a run has set in, the run being to clear as much land as possible before the pillars are put up and then declare it a ten year old field. Not long ago, I happened to go to an eminence and afar off espied unmistakeable signs of a clearing in a forest across the valley ; I at once sped across and found to my disgust that a Khyberi, of whom there is a settlement in this part, had begun to nibble at a grand plateau, covered with a fine forest of blue pine, just as a mouse would nibble a corner of a cheese. I had therefore to stop work at Drogmula and hurry off to the place and for three days we were hard at work encircling this tableland with a line of pillars. While engaged in this work we found, alas,! that another miscreant had cultivated a small area in the very centre of the forest : we hope, however, to get rid of him as it is pretty certain this was unauthorised and not entered in his *Kheirat*. The wearying part of it all is that we know well enough this sort of thing is going on everywhere : and what is far worse, the Goojurs from Poonch squatting in the heart of the forests, clearing and building villages. Oh ! for half a dozen of my old friends of the Forest Department to run the thing through sharp and put an end to these little games ! !

As this Drogmula Chakla contains the only really valuable deodar forest in Kashmir proper, it has been decided to build a small forest house here. A lovely spot has been chosen on a small open plateau at the foot of the main ridge, it is surrounded by deodars and other trees and elevated well above the plain, and is just inside the forest boundary. A small stream of the purest water runs, just below, and while being far enough from villages to escape the village nuisances in the shape of dogs and cats, still near enough for all purposes of supplies and labour. It is hoped the house will be finished this summer, if so any Forest friends who find themselves in that locality are invited to make use of it, and they will not repent spending a few days in this beautiful spot.

The forests near Drogmula village contain perhaps an equal proportion, roughly speaking, of deodar and blue pine, and there are still fine trees to be found here and there, but they are not to be compared with the forests near Kandi which are almost pure deodar and have many more first class trees. The reproduction is very good in both places in favourable spots and as last year was a good seed year the ground is now covered with thousands of seedlings and as there is not much danger of fires now, it is hoped that many will survive. If so, it is pretty certain that the re-stocking of blank spaces will be assured ; the grazing will hardly affect it since very few cattle graze inside the forest, and goats and sheep go to the grassy uplands beyond the limits of the deodar. Having seen a good deal of deodar forest in my time, I have pretty nearly come to the conclusion that we need not be so very particular about cattle grazing, in fact, I would almost go so far as to say that it would be beneficial in many places in keeping down the rank herbage, and if my friend A. L. M. in Chamba, could only be induced, Mr. Editor, to send you his views on the subject, the question might be threshed out.* I always think of Compartment No. 6 in Kalatope, which has never been closed to grazing and yet its natural reproduction is wonderful ; I first saw it as far back as 1870 and 1871; and when I held charge of the Division in 1881, I went carefully over it and was surprised beyond measure to see how the young trees had gradually grown beyond the reach of cattle, and how the blank spaces were being gradually restocked; of course the number of cattle using the pasturage was small but then so it is almost everywhere in the hills. On the other hand in Kainthli and Bakani (Chamba) where no grazing whatever is allowed, it has been found that plants put out are completely choked by the strong growth of grass and other herbage.

(*To be continued.*)

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*NOTE.—We shall be glad if A. L. M will respond to this invitation

HON. ED.

VI.—EXTRACTS, NOTES AND QUERIES.

Forest fires in France.

We read in the *Revue des Eaux et Forêts* that owing to the drought there have been some serious forest fires in different parts of the country. And the worst is that they were clearly due to incendiarism. Near Alençon, parts of the forests of Perseigne and Ecouves were burnt, mostly Scots pine. In the Landes, about 137 sq. miles have been burnt over and enormous damage done. Special measures have had to be taken and several persons have been arrested, one of them actually in the act of firing the forest of Teich.

Forest Fires in England and America.

The following extracts show that the present phenomenally dry season in England has been productive of serious forest conflagrations. The results of fires in America as described in the last extract are simply appalling. They shew, if anything does, the need of an American Forest Department, part of whose chief business would be the organization of fire-protection and fire prevention works on a gigantic scale.

SEVENOAKS.—A fire has been raging at Sealchart, near Sevenoaks, and about forty acres of valuable underwood has been destroyed.

ARUNDEL.—Shortly after noon on Sunday a man lighted his pipe and threw the match on the bank of the main road between Pulborough and Arundel, Sussex. In an instant the grass and bracken took fire, the flames spread to the plantation at Watersfield Towers; and, in an incredibly short time, more than four acres of fir trees, shrubs, heather, and bracken were blazing furiously. The fire was confined to the plantation, which was extensively damaged, large numbers of trees and choice shrubs having been consumed.

AMERICA.—The forest fires in Northern Wisconsin, a portion of Minnesota, and the upper peninsula of Michigan continue to spread. In Minnesota the territory attacked by the flames extends over fifty miles, and includes eight new mining towns, four of which

have been completely destroyed. In Wisconsin, the fire is in scattered patches. Many small towns have been burned in the tract of country along the shore of Lake Superior, between Michigan and Minnesota, a distance of ninety-six miles, the flames embracing nearly 8,000 square miles. Ashland and other large cities are in danger. It is estimated that 100,000,000 square feet of pine have already been burned, and heavy rain can alone check the progress of the conflagration.

Opening of closed forests in France.

In consequence of the severe drought in France orders have been issued to Conservators of Forests to do all in their power either by allowing pasture in closed forests or by concessions of cutting grass, leaves, etc, to assist the owners of cattle in getting over their present distress. *Revue des Eaux et Forêts.*

The Rights of Khonds.

The Khonds of the Mohiri hills in the Ganjam district submitted a petition last year to H. E. the Governor of Madras setting forth certain grievances for which they craved redress. The first was that the fruit trees on their lands, instead of being left to their enjoyment, are leased out in auction by the Forest Department; second, that the officers of the Forest Department have abolished their ancient privileges of taking timber for ploughs, fuel, house-building, &c.; and third, that they are no longer permitted to clear jungle for cultivation. As regards the first grievance, Government and the Board of Revenue agree with the Collector that the Khonds deserve consideration. The old assessment on their lands was fixed with reference to both cultivated land and fruit trees, while the present assessment, which is in excess of the old, is calculated on the land alone. The present assessment was so fixed as to give nearly the same average rate per acre as before, but it stands to reason that a village which could afford to pay an average rate of Rs. 1-2 per acre for wet and dry land as long as it had also a number of fruit trees free of charge, can no longer afford the same rate when deprived of the trees. The loss to the Khonds can be estimated by the fact that the produce of these trees is now leased out at an annual rental of Rs. 421, but this does not represent their full value to the Khonds, which may be fixed correctly at Rs. 650, which is a great deal in a total assessment of Rs. 1,962 for the Mohiri hills, or roughly, a

third of the present assessment. But it is not intended to restore the old privilege of the use of forest produce free to the Khonds as it would not benefit these ignorant hill people, but would eventually go into the maws of low country sowcars. In fact, the Collector believes that the complaints really emanate from the latter and the Khonds are merely the "stalking horse" of the sowcars, to whom they are heavily indebted and who hope to make a profit from forest produce under cover of Khond rights. The fact of these unfortunate Khonds being in the clutches of the sowcars is proved by the fact that the patta lands of the village of Niliguda have actually passed by Civil decree to the hands of a money-lender, Jodda Naiko, of Berhampore, in satisfaction of debts due to him. To allow the Khonds the usufruct of the trees in the forest reserves free of charge is also most objectionable from a forest point of view, and to give them the free use of the trees outside the reserve would remove but a small part of their grievance, while to reduce the assessment will be a boon to all and should benefit the Khonds and not the money-lender, excepting where the patta has actually passed to the latter. Government has, therefore, decided to compensate the Khonds proportionately for the loss of usufruct of the trees in the forest reserves only by reduction of assessment, and to restore to them, if they prefer it, the unrestricted enjoyment of all trees situated in the waste lands outside the reserves. As regards kumeri cultivation or clearing jungle for cultivation and the cutting of wood, the Khonds cannot be said to have any legal grievance, for the former was a privilege and not a right, and had to be put a stop to in order to prevent the denudation of forests. The Khonds have liberty to cut wood, bamboos, &c., to any extent outside the forest reserves free of charge for all private purposes, and the area excluded is sufficient to provide for their necessities for many years to come.—(*Pioneer* May 1893.)

'The Panoram.'

A photographic camera, which it seems probable will in the future play an important part in the mapping of unsurveyed countries, has been invented by Colonel R. W. Stewart, R. E. and Mr. Tweedy of Plymouth. It has the advantage of being smaller then an ordinary camera of the same capacity, and is also lighter, all the fittings being made of aluminium. It is easy to manipulate, and not likely to get out of order. The instrument consists of a rectangular box, whose length from back to front is a little more than the focal length of the lens to be used, its height is somewhat greater than the width of the film (for an 8-inch spool the height would be just 9 inches), and the breadth is a fixed dimension of 5 inches for all sizes. This Camera rests on a circular disc, forming the head of the tripod-stand; to the bottom of the box is screwed, in a central position, a

tubular arbor fitting into a socket in the disc and the camera revolves freely on the stand; the box opens down one of its vertical edges, so as to give access to the hinder part of the camera or roll-holder: in this roll-holder are fixed four vertical rollers. The first of these has the tissue supplied by the Eastman Company wound on it, the second and third rollers serve to keep the film in the focal plane; and the fourth, which is called the winder, is actuated by a clock motion, with fly escapement, placed in the front part of the camera, the fly being normally blocked by an arm actuated by a pneumatic ball and tube of the ordinary kind. When required for use, the camera is set up on its stand and levelled, the clock is wound up, the slit aperture adjusted, and a suitable stop put in; the camera is then turned round till it points to the left hand of the view required, the pneumatic bulb is squeezed when the clock starts working, and the camera begins to rotate, and continues to do so until the right-hand corner of the view is reached; the bulb is then relaxed, the clock stops, and the camera ceases to revolve. This is but a very general description of this ingenious instrument, which if used at each end of a base will give the angles between all objects photogrphed. The speed of rotation of the camera itself, and the rollers on which the film is wound, being all actuated by one motor and connected with one another, the ratios of motion must remain the same, and as the rates of such motion can be regulated by altering the ratio of the diameters of the roller and its pulley, it follows that the true rate of motion can be found. In the larger form of camera the films are rather more than 5 feet long, when photographs of the whole circle are taken, in which case they are developed by being primed on to the periphery of a drum, mounted on a horizontal axis, the sensitive surface just dipping into a dish holding the developer, the drum is then rotated until development is complete.—(*Geographical Journal.*)

Wayside Planting by Village Improvement Societies.

In the planting of trees by village improvement societies both use and beauty should be included in "improvement." What is useful and beautiful in one case may be unnecessary and unpleasing in another. The great aim should be appropriateness. For instance, no tree is more suitable for shading village streets than the Elm, its high arching branches affording ample shade for comfort and not enough to keep the road in a muddy condition after rain. The old New England towns owe much of their charm to the wayside Elm. I refer especially to villages and towns where houses and shops are close together. Outside of towns, on inland high-roads, long level stretches of Elms may be used effectively, especially where clusters of houses at short intervals form a semi-

detached village. There are many other fine shade-trees which may be planted for variety:—the Oak, Maple, Beech, Chestnut and Linden. The Tulip-tree has recently been suggested for roadside planting, but it is not a graceful tree for this purpose.

For a shade-tree along much frequented inland roads, the Elm has an evident advantage over conically shaped trees. It is admirably adapted, also, for planting on home and school-house grounds and for shade in fields. Along less frequented roads, in many places, no trees should be planted at all. I have in mind a country road where occasional White Birches had grown up irregularly, and Maples had recently been planted on either side. In several instances a young Maple was set out directly under a good sized Birch. The new trees might have been grouped naturally at intervals for shade and thus made to harmonize with the irregular Birches, but the effect of this planting was formal in the extreme. I know also a triangle by a country highway where a few Pitch Pines at one end have been left in a group. I doubt if any one would have thought of planting Pines in such a spot in such a manner, but the effect of this natural arrangement is both interesting and beautiful.

As a rule, our country road-sides are at their best when planted by nature. Open views on one or both sides of the way, alternating with shady spaces, are vastly more attractive than continuous, monotonous, artificial planting. Occasionally we see a piece of road on which trees would be an improvement, especially where a new way has been cut through a bare region. But often nothing is wanted beyond leaving the bushes and vines unharmed. Now and then there is an obtrusively ugly spot where an adjoining bank of the highway has been dug out for gravel or blasted for rock. In such a spot, a clump of English Beeches or White Birches in the foreground would quickly soften the effect. In repairing our roads, care should be taken not to disturb the wild Roses, Barberries, Ellerberries and many other delightful shrubs and flowers where they will flourish and multiply if left alone; if these have been disturbed it would be well to replace them.

I would urge, also, that our country roads be not widened unnecessarily. In villages and towns wide roads are important, but in the country, narrow roads are, as a rule, much more picturesque. As to the useful side of the question, Professor Shaler, in a recent article on the "Betterment of our Highways" writes: "In this country as well as in most of the states of Europe, the tendency is to make the road-bed a good deal wider than sound practice dictates. A part of the badness of our American roads is generally due to the fact that the tracking is far too wide to be effectively maintained. In this, as in many other of the grosser arts, we may well take a lesson from the ancient Romans, perhaps

the earliest skilful road-makers in the world. Their roads were, indeed, much narrower that those which are commonly found in our country districts."

If more trees are desired for a tree-lined sea-shore road with occasional stretches affording glimpses of the ocean, other kinds than inland Pines should be chosen. These should not be set regularly in a row, but in occasional groups. Willows, and in some especially adapted places a row of Lombardy Poplars, harmonize with marsh or sea. An objection to Lombardy Poplars may be made because they are not long-lived; but where they are planted at rare intervals for beauty, not for shade, they can be replaced after a number of years.

I should suggest that these three points be borne in mind: Where continuous passing and frequent lounges close to the road (as in village streets,) demand shade-trees, there artificial and regular tree-planting, especially of Elms, is appropriate both for use and beauty. That in improving country roads outside of villages, we should remember that improving does not necessarily mean changing in effect apart from keeping the road in order. That what may be a most charming addition inland may be inharmonious by the sea; and that in every case we should consider whether we are working for use or for beauty, or for both combined, so that each result may be appropriate.—*(Garden and Forest.)*

To our Exchanges.

We should be much obliged if those Editors of contemporaries in India with whom we exchange this Journal would pay us the usual compliment of acknowledging, as we ourselves invariably do, the source of their extracts. In the 'Indian Agriculturist' of July 8th there is one such extract from our June No. from the article on 'Experiments at Dehra Dun' which *must* have come from our pages; there is one extract from our 'Review of Road Arboriculture in the Central Provinces,' an obvious extract because the reference to 'Arbor Day' was our own and did not occur in the report; and there are no less than six short paragraphs on the subjects of 'Assam indiarubber trade', exploration of Indiarubber in Burma', 'reproduction of Sal in Assam' "relation between the flowering of bamboo and the reproduction for teak" 'casks from Indian Oak woods' and 'planting of cutch in Burma', all of which bear every appearance of having come, with slight alterations here and there, from our Review of the Forest Administration Reports. Not one of these acknowledges the Forester as its original publication. Even the *Indian Forester* which depends on departmental interests for its circulation chiefly and has not to advertise itself, likes to have the credit of its work.

VII—TIMBER AND PRODUCE TRADE.

Statement of average selling rates of timber and bamboos in Meerut, Cawnpore, Bulandshahr, Pilibhit, Bareilly, and Moradabad for the quarter ending 31st March, 1893

Description.	Timber Scantlings per score.		Bamboos per 100 score.		Remarks.
	From	To	From	To	
MEERUT.	R. A. P.	R. A. P.	R. A. P.		
Sal 10′ Tors (Poles) ...	8 0 0	18 0 0	...	...	
Sal & Sain, &c., Karris, 12′ × 5″ × 4″	25 0 0	40 0 0	...	...	
Sal bed posts, 7′ × 2½″ × 2½″ ..	8 0 0	12 0 0	.	...	
Bamboos of 9′ to 10′ per 100 score ...	...	...	28 0 0	80 0 0	
CAWNPORE.					
Sal 10′ Tors (Poles) ...	5 0 0	6 0 0	...	...	
Sal, and Sain &c., Karris, 12′ × 5″ × 4″ ...	25 0 0	100 0 0	...	...	
Sal bed posts, 7′ × 2½″ × 2½″ ...	15 0 0	19 0 0	...	...	
Bamboos of 9′ to 10 per 100 score	...	...	25 0 0 30 0 0 50 0 0	30 0 0 50 0 0 1,000 0 0	
BULANDSHAHR.					
Sal 10 Tors (Poles) ...	..	...	. .	..	
Sal, and Sain &c., Karris, 12′ × 5″ × 4″ ...	...	.	...	...	
Sal bed posts, 7′ × 2½″ × 2½″ ..	. .	...	...	..	
Bamboos of 9′ to 10′ per 100 score ...	...	...	50 0 0	50 0 0	
PILIBHIT					
Sal 10′ Tors (Poles) ...	40 0 0	70 0 0	...	...	
Sal and Sain, &c. Karris 12 × 5″ × 4″ ...	30 0 0	40 0 0	...	...	
Sal bed posts 7′ × 2½″ × 2½′ .	5 0 0	6 4 0	..	...	
Bamboos of 9′ to 10′ per 100 score ...	...	...	60 0 0	100 0 0	
BAREILLY					
Sal 10′ Tors (Poles) ...	5 0 0	10 0 0	...	..	
Sal & Sain, &c., Karris, 12′ × 5″ × 4″	25 0 0	35 0 0	...	...	
		40 0 0	..	...	
	50 0 0	60 0 0	...	...	
Sal bed posts 7 × 2½″ × 2½′ ...	10 0 0	15 0 0	...		
Bamboos of 9′ to 10′ per 100 score ...	...		50 0 0	137 8 0	
MORADABAD					
Sal 10′ Tors (Poles) . .	20 0 0	25 0 0	...	...	
Sal, & Sain, &c., Karris, 12′ × 5″ × 4″ ...	30 0 0	50 0 0	...	...	
Sal bed posts 7′ × 2½″ × 2½″ ...	10 0 0	12 8 0	...	...	
Bamboos of 9′ to 10′ per 100 score ...	...	...	50 0 0	100 0 0	

Churchill and Sim's Circular.

JULY 4th 1893.

EAST INDIA TEAK.—The deliveries for the first half of the year were 6564 loads in 1893, 5,665 loads in 1892, and 8,055 loads in 1891. For June in the three years the figures are respectively 1,257 loads, 1,396 loads, and 1,487 loads. The state of the shipping trade still weighs heavily on the Teak market, and business, continues greatly curtailed. The stock remains about stationary, and there is no change in quotations save for some balances having been cleared off at auction, mostly at impossible prices.—

ROSEWOOD.—Stocks are moderate, but ample for current demand which is full.—

SATINWOOD.—For finely-figured *logs*, good prices could be made, but for small, plain wood there is very little enquiry, and *planks* and *boards* are not wanted.—

EBONY.—Sells very slowly, even at the low prices now current.—

PRICE CURRENT.

Indian Teak	per load	£9	to	£15
Satinwood	„ ton	£5	to	£12
Rosewood	„ „	£5	to	£9
Ebony	„ „	£5	to	£7

MARKET RATES OF PRODUCTS.

(*Tropical Agriculturist, July 1893.*)

Cardamoms, Malabar	per lb.	2s.	to	2s.6d.
Croton seeds	per cwt.	16s.	to	20s.
Cutch	„	20s.	to	27s.6d.
Gum Arabic, Madras	„	15s.	to	50s.
Gum Kino	„	£15	to	£20.
India Rubber, Assam	per lb.	1s.7d.	to	2s.3d.
„ Rangoon	„	1s.7d.	to	1s.11d.
Myrabolams, Bombay	per cwt	10s.	to	11s.3d.
„ Godavari	„	7s.9d.	to	8s.3d.
Nux Vomica	„	8s.	to	9s.6d.
Orchella	„	22s.	to	28s.
Redwood	per ton	£3.	to	£3-10s
Sandalwood, logs	„	£35	to	£55
„ chips	„	£9	to	£30
Sapan wood	„	£4.	to	£7.
Seedlac	per cwt	40s.	to	70s.
Tamarinds	„	8s.	to	9s.

VIII.—EXTRACTS FROM OFFICIAL GAZETTES.

1.—Gazette of India.

21st July, 1893.—No. 796-F.—Consequent on the return from privilege leave of Mr. E. P. Dansey, Conservator of Forests, 2nd grade, Bengal, the following reversions are ordered, with effect from 14th July 1893:

Mr. R. H. E. Thompson, Conservator, 3rd (officiating 2nd) grade, Northern Circle, Central Provinces, to his substantive grade.

Mr. E. G. Chester, Officiating Conservator, 3rd grade, Bengal, to his substantive appointment of Deputy Conservator, 1st grade,

2.—Madras Gazette.—

26*th June*, 1893.—M. R. Ry. C. M. Maduranayagam Pillai, Sub-Assistant Conservator, from North Arcot to South Arcot District—to join on expiration of his leave.

1*st July*, 1893.—Ranger P. Venkatakrishnama Naidu from Salem to North Arcot.

17*th June*, 1893.—N. Nagarazu, Forest Ranger, 5th grade, Palkonda Range, Vizagapatam District, is granted two months privilege leave, with effect from the 8th of June, 1893.

28*th June*, 1893.—Mr. H. Stafford, Forest Ranger, Kurnool, is granted fifteen days' privilege leave, with effect from 27th June 1893, or from such date as he avails himself of the same.

3*rd July*, 1893.—A. R Rama Row, Ranger on Rs. 50, is transferred from North Coimbatore to South Coimbatore—To join at once.

9*th July*, 1893.—The one month's privilege leave granted in Service Order No. 87 of 1893 to Mr. C. P. Howell, Sub-Assistant Conservator on Rs. 150, Madura, from 7th May 1893, is hereby commuted into leave on medical certificate, under article 369 of the Civil Service Regulations, and the same is extended by five months.

15*th July*, 1893.—No. 360—Mr J. G. F. Marshall, Acting District Forest Officer, North Arcot, is granted privilege leave for three months, with effect from or after 1st August 1893, under article 291 of the Civil Service Regulations.

17*th July*, 1393.—The transfer of Ranger P. Venkatakishnama Naidu from Salem to North Arcot District, ordered in this office order No. 38 of 1893-94, is cancelled.

20*th July*, 1893—Ranger Mr. Middleton is granted two months' leave without allowances, under article 372 of the Civil Service Regulations, with effect from 22nd June 1893

20*th July*, 1893.—A. S. Mariapragasam Pillai, Ranger on Rs. 80, South Coimbatore Division, is granted sick leave on medical certificate for three months, under article 369 of the Civil Service Regulations, from date of relief.

3.—BOMBAY GAZETTE.

1st July, 1893.—Messrs. W. R. Woodrow and T. R. D. Bell, Deputy Conservators, respectively delivered over and received charge of the Divisional Forest Office, Bijapur, on the forenoon of the 22nd June 1893.

3rd July, 1893.—Mr. J. H. Clabby, Extra Assistant Conservator of Forests, handed over charge of the Poona Sub-Division Forest Office to Mr. A. D. Wilkins, Deputy Conservator of Forests, on the afternoon of the 27th June 1983.

Mr. S. Hormidge, A. M. I. C. E., Deputy Conservator of Forests, delivered over and Mr. J. H. Clabby, Extra Assistant Conservator of Forests, received charge of, the Divisional Forest Office, Sholàpur, on the forenoon of the 28th June 1893.

3rd July, 1893.—No. 4751.—Mr. A. C. Robinson, L. C. E., Extra Assistant Conservator of Forests, Fourth Grade, and Sub-Divisional Forest Officer, Kolaba, is allowed privilege leave of absence for three months from 10th July 1893.

5th July, 1893.—No. 4864.—Mr. T. B. Fry, Deputy Conservator of Forests, Second Grade, and Divisional Forest Officer, Working Plans, N. C., is allowed privilege leave of absence for three months from 4th August 1893.

8th July, 1893.—No. 4946.—His Excellency the Governor in Council is pleased to appoint Mr. G. P. Millett to act as Working Plans Officer, Northern Circle, in addition to his own duties, during the absence of Mr. T. B. Fry on privilege leave, or pending further orders.

12th July, 1893.—No. 5067.—His Excellency the Governor in Council is pleased to appoint Mr. Ganpat Jayavant Rege to act as Extra Assistant Conservator of Forests in the Fourth Grade, during the absence of Mr. A. C. Robinson, L. C. E, or pending further orders.

7th July, 18 3.—Mr. Lakshman Daji Joshi. Extra Assistant Conservator of Forests, delivered over charge of the Sub-Division Forest Office, East Khándesh, to Mr. R. H. Madan, Extra Assistant Conservator of Forests, on the afternoon of the 28th June 1893, and received charge of the Sub-Division Forest Office, Poona, from Mr. A. D. Wilkins, Deputy Conservator of Forests, on the forenoon of the 3rd instant.

4.—BENGAL GAZETTE.

26th June, 1893.—No. 2390.—Mr. W. H. Lovegrove, Officiating Deputy Conservator of Forests, 4th grade, in charge of the Kurseong Division, on being relieved of that charge by Mr. Lillingston, is posted to the charge of the Chittagong Division.

Mr. C. A. G. Lillingston, Officiating Deputy Conservator, 3rd grade, Darjeeling, will hold charge of the Kurseong Division in addition to his other duties.

6th July, 18 3.—No. 2409.—Mr. H. H. Haines, Officiating Deputy Conservator of Forests, in charge of the Jalpaiguri Forest Division, is granted leave for three months, under article 291 of the Civil Service Regulations, with effect from the 24th July 1893, or any subsequent date on which he may avail himself of it.

Mr. C. C. Hatt, Assistant Conservator, attached to the Darjeeling Forest Division, is appointed to have charge of the Jalpaiguri Forest Division, during the absence of Mr. Haines.

13*th July*, 1893.—No. 2468.—Mr. R. L Heinig, Deputy Conservator of Forests, was employed as Working Plans Officer in connection with the preparation of a Working Plan for the Sunderban Forests, from February to May 1892 inclusive.

15*th July*, 1893.—No. 2505.—Mr. C. A. G Lillingston, Deputy Conservator of Forests, was attached to the Direction Division from the 11th to the 16th October 1892, both days inclusive.

25*th July*, 1893.—No. 2634.—The services of Rai Sahib Kirty Chunder Chaudhuri, Assistant Engineer, which were placed at the disposal of the Revenue Department in the Public Works Department Notification No. 315, dated the 14th November 1892, are replaced at the disposal of that Department, with effect from the 7th August 1892, or such subsequent date as he may have completed the work in the Forest Department, on which he is now employed.

5.—N W. P. AND OUDH GAZETTE.

3*rd July*, 1893.—No.—1876.—Lála Har Swarup, Extra Assistant Conservator of Forests, from the 4th to the 3rd grade, with effect from the 23:d July 1892, *vice* Sardar Hira Singh, promoted.

6.—PUNJAB GAZETTE.

3*rd July*, 1893.—No. 381.—*Notification.*—Bhái Sadhu Sinigh Extra Assistant Conservator of Forests, and Mr. L. Gisborne Sm th Deputy Conservator of Forests, respectively made over and receiveh charge of the Hazára Forest Division on the afternoon of the 14td June 1893.

Bhái Sadhu Singh will remain attached to the Hazára Division.

7.—CENTRAL PROVINCES GAZETTE.

29*th June*, 1893. No. 3005.—The Officiating Chief Commissioner is pleased to invest the undermentioned Forest Officers with the powers defined in Section 71, Act VII of 1878 (the Indian Forest Act), to be exercised within the limits of their respective Divisions :—

Name.		*Designation*
Mr. G. F. Taylor	...	Deputy Conservator of Forests
Mr. A. M. Caccia	...	Assistant Conservator of Forests
Mr. S. G. Pranjpe	...	Extra-Assistant Conservator of Forests.

17*th July*, 1893.—No. 5316.—The following officer of the Forest Department has passed the prescribed examination in vernacular as shown below :—

HINDUSTANI.

By the Higher Standard.

Mr. N. C. McLeod, Extra-Assistant Conservator.

18*th July*, 1893.—No. 3304.—Mr. E. Dobbs, Deputy Conservator of Forests, Central Provinces, has been granted, by her Majesty's Secretary of State for India, two months' leave on medical certificate in extension of the one year's leave previousiy granted him by Notification No. 2753 of the 5th August 1892.

20th July, 1893.—No. 3332.—Mr. R. C. Thompson, Extra-Assistant Conservator of Forests, in charge of the Pranhita-Godavari Sub-Division, in the Chanda Forest Division, is transferred to the Mandla Forest Division in the same capacity.

8.—BURMA GAZETTE

20th June, 1893.—No. 11.—With reference to the Revenue Department Notification No. 205 (Forests), dated the 10th June 1893, Mr C. W. A. Bruce, Assistant Conservator of Forests, assumed charge of the Upper Chindwin Forest division and of the Paungbyin Sub-division of that division from Mr. H. H. Forteath, Assistant Conservator, on the afternoon of the 16th June 1893, and Mr. Forteath reported his arrival at Mandalay and assumed charge of his duties as Personal Assistant to the Conservators of Forests, Eastern and Western Circles, on the afternoon of the 19th June 1893.

23rd June, 1893.—No. 6.—With reference to Revenue Department Notification Nos. 225 and 226, dated the 21st June 1893, Mr W. F. L. Tottenham, Assistant Conservator of Forests, made over, and Mr. J. Allmark, Extra Assistant Conservator of Forests, received charge of, the Rangoon Depôt and Agency Division on the afternoon of the 21st June 1893.

30th June, 1893.—No. 235.—Under the provisions of Article 282 *(a)* (i) of the Civil Service Regulations, privilege leave for three months and six days is granted to Mr F. J. Branthwaite, officiating Deputy Conservator of Forests, with effect from the 11th July 1893, or the subsequent date on which he may avail himself of it.

5th July, 1893.—No. 137.—At the Departmental examination held at Akyab, Bassein, Henzada, Thayetmyo, Môulmein, Tavoy, Mandalay, Bhamo, Katha, Mogôk, Ye-u, Kindat, Monywa, Minbu, Myingyan, Meiktila, and Taungyi (Southern Shan States), the following candidates passed in Burmese by the standards specified :—

Higher Standard.

Mr. A. M. Burn-Murdoch, Assistant Conservator of Forests.

Lower Standard.

Mr. S. Carr, Assistant Conservator of Forests,—*with credit.*

Mr. P. W. Healy, Extra Assistant Conservator of Forests.

6th July, 1893.—No. 243.—Mr. T.A. Hauxwell, Deputy Conservator of Forests, Salween-Attaran division, is placed temporarily in charge of the Agency division, Tenasserim circle, in additiou to his other duties.

6th July, 1893.—No. 244.—Mr. G. R. Long, Assistant Conservator of Forests, in charge of the Agency division, is transferred temporarily to special duty in the Kado division.

7th July, 1893.—No. 142.—At the Departmental examination held at Mogok, Minbu, Meiktila, and Moulmein on the 5th June 1893, the following Forest Officers passed in the subjects specified opposite their names according to the standards prescribed for the examination of

Forest Officers in Chapter IV of the Departmental Examination Rules :—

Name.	*Passed in.*
Mr. A. M. Burn Murdoch, Assistant Conservator of Forests	Law and Revenue.
Mr. G. R. Long. Assistant Conservator of Forests	Procedure and Accounts.
Mr. S. Carr, F. C. H., Assistant Conservator of Forests	Ditto ditto
Mr. W. J. Lane-Ryan, Extra Assistant Conservator of Forests ...	Ditto ditto.
Mr. R F. Lowis, Extra Assistant Conservator of Forests	Law, Procedure, & Accounts.

3rd July, 1893.—No. 7.—With reference to Revenue Department Notification No. 215, dated the 19th June 1893, Mr. J. Messer, Assistant Conservator of Forests relinquished charge of his duties in the Working Plans Division on the afternoon of the 23rd June 1893.

No 8.—With reference to the aforesaid Notification, Mr. Messer, Assistant Conservator of Forests, assumed charge of his duties in the Toungoo division on the forenoon of the 24th June 1893.

3rd July, 1893.—No. 5.—With reference to Revenue Department Notification No. 223 (Forests), dated the 20th June 1893, Mr. C. R. Dun, Assistant Conservator of Forests, received charge of the Mandalay Forest Division from Mr. H. Calthrop, Deputy Conservator of Forests, on the afternoon of the 30th June 1893.

1st July, 1893.—No. 12 —With reference to Revenue Department Notification No. 190 (Forests), dated the 25th May 1893, Mr. D. L K. Calderwood, Extra Assistant Conservator of Forests, assumed charge of the Gangaw subdivision, Yaw Forest Division, on the 13th June 1893.

5th July, 1893.—No. 6.—With reference to Revenue Department Notification No. 224 (Forests), dated the 20th June 1893, Mr. R. F. Lowis, Extra Assistant Conservator of Forests assumed charge of the Myadaung forest subdivision in addition to his other duties on the forenoon of the 3rd July 1893.

12th July, 1893.—No. 9.—Mr. F. J. Branthwaite, officiating Deputy Conservator of Forests, in charge Working Plans Division, availed himself on the afternoon of the 10th July 1893 of the privilege leave granted him in Revenue Department Notification No. 235, dated the 30th June 1893.

17th July, 1893 —No. 254.—The following promotions are made in the Forest Department ;—

With effect from the 1st January 1893, consequent on Major Bingham's confirmation as a Conservator of Forests :

Mr. J. Nisbet, Deputy Conservator, 2nd grade, to be Deputy Conservator, 1st Grade.

Mr. T. A. Hauxwell, Deputy Conservator, 3rd (officiating 2nd) grade, is confirmed in that grade.

Mr. J. Copeland, Deputy Conservator 4th grade, to be Deputy Conservator, 3rd grade.

Mr. A. F. Gradon, Assistant Conservator, 1st (officiating Deputy Conservator, 4th) grade is confirmed in that grade.

Mr. G. F. R. Blackwell, Assistant Conservator, 1st (officiating Deputy Conservator, 4th) grade, is confirmed in that grade.

Mr. W. W. T. McHarg, Assistant Conservator, 2nd (officiating 1st) grade, is confirmed in that grade.

With effect from the 1st July 1893, the date of Mr. Calthrop's transfer to Berar :—

Mr. C. L. Toussaint, Assistant Conservater, 1st (officiating Deputy Conservator, 4th) grade, is confirmed in that grade.

Mr. C. W. A. Bruce, Assistant Conservator, 2nd (officiating 1st) grade, is confirmed in that grade.

No. 255.—The Chief Commissioner is pleased to direct that, with effect from the 1st October 1893, the Southern Shan States and the Myelat, as defined in Foreign Department Notification No. 14, dated the 26th November 1891 shall be formed into a Forest Division of the Eastern Circle, that the division shall be called the Southern Shan States division, and that its headquarters shall be Fort Stedman.

No 256.—Mr. H. Jackson is appointed to the charge of the Southern Shan States Forest Division with effect from the 1st October 1893.

11.—MYSORE GAZETTE.

No. 74—G. 38.—Under Article 171 of the Mysore Service Regulations, Mr. Venkatnaranappa, Sub-Assistant Conservator of Forests, Tumkur District, was granted casual leave of absence for 5 days from from 19th June 1893.

4th July, 1893.—No. 304.—G. 102.—Mr. S. A. Baput Rao, Assistant Conservator, dellivered over, and Mr. C. E. M. Russell, Superintendent of Forests, assumed, charge of, the Bangalore District Forest Office on the forenoon of the 24th June 1893.

2. Mr. S. A. Bapu Rao is appointed to act as Head-quarter Assistant Conservator of Forests during the absence of Mr. T. Abdul Karim on leave.

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